


House Agriculture  
Committee

March 21, 2007

Keith Reinholt  
Michigan Soybean  
Promotion Committee

 ✓ off

---

---

---

---


---

---

---

Reporting on behalf...

- 12,000 Michigan soybean producers
- Over 2.0 million acres
- Production of 90 million bushels
- Create over 5,000 jobs
- Contribute over \$1 billion

 ✓ off

---

---

---

---


---

---

---

Personally...

... any perceived lack of BioDiesel  
interest is really a lack of  
BioDiesel/Diesel knowledge

 ✓ off

---

---

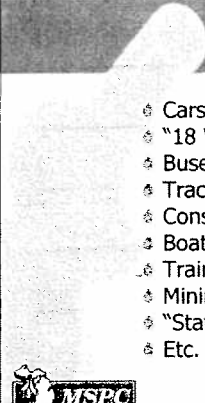
---

---

---


---

---



### Diesel Engine's Are "Everywhere"

- ✦ Cars/trucks
- ✦ "18 Wheelers"
- ✦ Buses
- ✦ Tractors/heavy equipment
- ✦ Construction/demolition
- ✦ Boats/vessels
- ✦ Trains
- ✦ Mining/logging industries
- ✦ "Stationary" power
- ✦ Etc.



✓ off

---

---

---

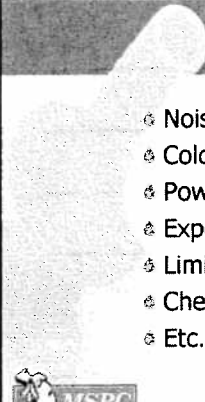
---

---

---


---

---



### Diesel Engine Myths

- ✦ Noisy/smelly/dirty
- ✦ Cold weather challenges
- ✦ Power/acceleration
- ✦ Expensive
- ✦ Limited fueling sites
- ✦ Cheap fuel
- ✦ Etc.



✓ off

---

---

---

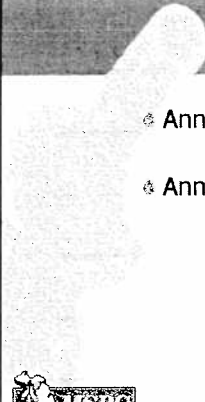
---

---

---


---

---



### Diesel Fuel Usage

- ✦ Annually in U.S. 60 bb gallons
- ✦ Annually in Michigan 1 bb gallons



✓ off

---

---

---

---

---


---

---

---

**Presently Soyoil is BioDiesel**

- Abundance
  - ✓ Accounts for 75% of domestic fats/oil
- Price
  - ✓ Since available, competitively priced
- *Functionality*
  - ✓ Easily/effectively *transesterified*
- A direct result of Soybean Farmers Market Development over the last 15 years

 ✓ off

---

---

---

---

---


---

---

---

**In Reality...**

...taking a **good** fuel and  
making it **better**

 ✓ off

---

---

---

---

---


---

---

---

**BioDiesel Fuel Facts**

- Estimated production of operating/under construction plant in U.S. 2.6 bb gals (4% of diesel market)
- Estimated production of operating/under construction plants in Michigan 35 mm gals (3.5% of diesel market)

 ✓ off

---

---

---

---

---

---

---


---

### BioDiesel Fuel Facts

Estimation of biodiesel production plants operating or under construction...

... in U.S. is 182

... in Michigan is 5



✓ off

---

---

---

---

---

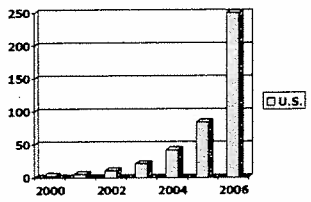
---

---


---

### BioDiesel Fuel Facts

B100 Usage Estimate for U.S. per Million Gallons



Year	B100 Usage (Million Gallons)
2000	~5
2001	~10
2002	~15
2003	~25
2004	~45
2005	~90
2006	~240



✓ off

---

---

---

---

---

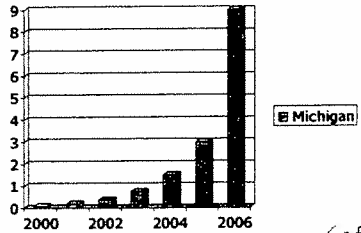
---

---


---

### BioDiesel Fuel Facts

B100 Usage Estimate for Michigan per Million Gallons



Year	B100 Usage (Million Gallons)
2000	~0.2
2001	~0.5
2002	~0.8
2003	~1.2
2004	~1.8
2005	~3.2
2006	~9.0



✓ off

---

---

---

---

---

---

---

---

### BioDiesel Fuel Characteristics

- ⌘ Little to no engine modifications
- ⌘ Blending
  - Bxx
  - Easily splash blended
  - No "over" blending concerns
- ⌘ Use existing storage/dispensing facilitates
- ⌘ No delay/phase-in for use

✓ off

---

---

---

---

---

---

---

---

### BioDiesel Fuel Characteristics Cont.

- ⌘ Fuel pump lubricity enhancer
- ⌘ B100 contains no sulfur
- ⌘ High energy balance: 3.2 to 1
- ⌘ Addresses imported oil concerns
- ⌘ Addresses regulatory concerns
- ⌘ Addresses health/environmental concerns

✓ off

---

---

---

---

---

---

---

---

### BioDiesel Fuel Characteristics Cont.

- ⌘ ONLY alternative fuel to successfully complete EPA's Tier I and Tier II Health Effects testing
- ⌘ Depending on Bxx levels, lowers CO, CO<sub>2</sub>, PM THC, S
- ⌘ May help address clean air ozone rules and greenhouse gases
- ⌘ Debate on emission levels of NO<sub>x</sub>

✓ off

---

---

---

---

---

---

---

---

## BioDiesel Fuel Characteristics Cont.

**Awareness Issues:**

- ⌚ Engine/fuel warranties
  - ✓ Normally contain a B5 Statement
- ⌚ Bxx cold weather handling
  - ✓ B20 compared to B100
- ⌚ Quality assurance
  - ✓ ASTM D6751 fuel spec established in 2000

✓ off

---

---

---

---

---

---

---

---

## Historical Perspective

- ⌚ Soybean growers interest began in 1992
  - ✓ National Biodiesel Board Formed
    - Michigan was a charter member
  - ✓ Soybean growers funded the first biodiesel fueled pick-up in Michigan
  - ✓ Initially soybean office received B100 via UPS in 5 gallon containers

✓ off

---

---

---

---

---

---

---

---

## Historical Perspective Continue

- ⌚ *Demonstration* of biodiesel use in '90's
  - ✓ Soybean office biodiesel fueled truck (5 trucks driven over 600,000 miles)
  - ✓ Flint MTA
  - ✓ Lake Huron research vessel
  - ✓ Farm activities
- ⌚ EPACT 92 Amendment in 1998

✓ off

---

---

---


---

---

---

---

---



### Historical Perspective Continue

- State of Michigan began use in 1999
- Pictured Rocks (U.P.) began use 2000
- St. Johns School District began use in 2002
- Etc.

☒ off

---

---


---

---

---

---

---



### Present Michigan Use:

- 50 Plus School Districts
- 30 State/National Parks
- County Road Commissions
- State and Local Governments

☒ off

---

---


---

---

---

---

---



### Present Michigan Use:

- Universities
- Utilities
- County Fairs Amusement Providers
- Agriculture (50% of farmers use Bxx)

☒ off

---

---

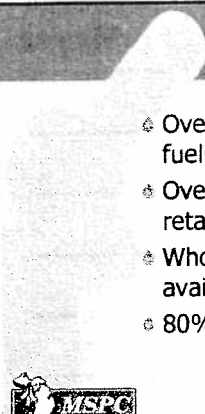
---

---

---


---

---



### BioDiesel Availability in Michigan

- Over 50 known retail pump fueling sites
- Over 110 known retailers/distributors
- Wholesale blending facilities available
- 80% of retailers knowledgeable



✓ off

---

---

---

---

---

---

---

---



### Market Development Needs (near term)

- "TEAM" biodiesel approach (beyond soybean industry)
  - ✓ Feedstock providers
  - ✓ Production/distribution chain
  - ✓ Diesel engine promotion
  - ✓ Auto manufacturing/OEM (GM European *Lacetti* offering)
  - ✓ State government (MDA diesel fuel enforcement)



✓ off

---

---

---

---

---

---

---

---



### Market Development Needs Continued

- Finalized B20 ASTM Standard
- Pipeline distribution research
- Truck stop availability
- Fuel cloud/gel point needs
- "Separate" biodiesel RFS definition



✓ off

---

---

---

---

---

---

---

---



Beyond Soy BioDiesel

Multiplicity of Feedstocks (MI)

✓ Designer Soybean oil

✓ Industrial hemp

✓ Corn oil from DDG

✓ Rapeseed/canola

✓ Yellow grease

✓ Trap grease

✓ Flax

✓ Sunflowers

✓ Camelina

✓ Cophea

✓ Animal fat

✓ ????

MSPC

✓ off

---

---

---

---

---

---

---

---

Beyond Soy BioDiesel  
("out-of-box" concepts)

✓ Jatropha  
(perennial "tree crop" producing seeds)

✓ Algae  
(grown/harvested for fuel production)

✓ Pyrolysis of biomass  
(thermally cracking of molecules)

MSPC

✓ off

---

---

---

---

---

---

---

---

Beyond Soy BioDiesel  
("out-of-box concepts")

✓ Alteration of plant oil chemical composition for direct fuel application

✓ Altering plant metabolism for producing oil in leaves, stems as well as seeds

✓ Petro/Bio processing synergy

✓ Innovative feedstock processing from "newer" technologies

MSPC

✓ off

---

---

---

---

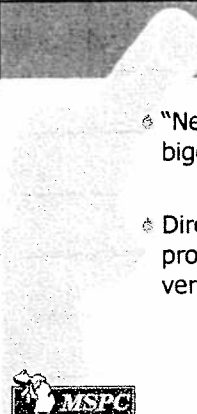
---

---

---


---

9



### Sourcing BioDiesel Feedstock in Michigan

- ⌚ "Near term," one of Michigan's biggest challenges
- ⌚ Direct bearing on biodiesel production plant versatility/location


✓ off

---

---

---

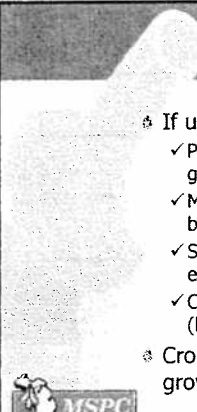
---

---

---


---

---



### Sourcing BioDiesel Feedstock in Michigan

- ⌚ If using an annual field crop
  - ✓ Processing capacity/capability of field crop grown
  - ✓ Marketing of crop processed by-products
  - ✓ Securing crop acreage in competitive economic market
  - ✓ Crop handling, storage, transporting (logistics)
- ⌚ Crop should be at least "regionally" grown


✓ off

---

---

---

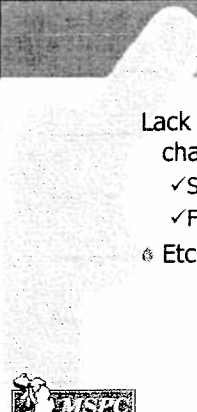
---

---

---

---


---



### Sourcing BioDiesel Feedstock in Michigan

Lack of "animal industry" causes challenges

- ✓ Slaughter house feedstock
- ✓ Feed by-product market
- ⌚ Etc.???


✓ off

---

---

---

---

---


---

---

---

Summary...

- Michigan is very competative for biodiesel plant sighting.
- Michigan has availability of qualified labor.
- In planning, we must carefully evaluate biodiesel feedstock sourcing specifically for Michigan biodiesel production.



✓ off

---

---

---

---


---

---

---

Summary...

- Infrastructure and industries to support concept must be considered.
- ONE well coordinated and funded central biodiesel "facilitator" (processing, feedstock, policy, agronomics, etc.)



✓ off

---

---

---

---


---

---

---

Soybean Office Facilitation

- Remain an initial contact
- Provider/facilitator of info
- BioDiesel/biobased supplier list at [www.michigansoybean.org](http://www.michigansoybean.org)
- Willingness to work with you
- Thank you



✓ off

---

---

---

---

---

---

---

